

FIG. 1

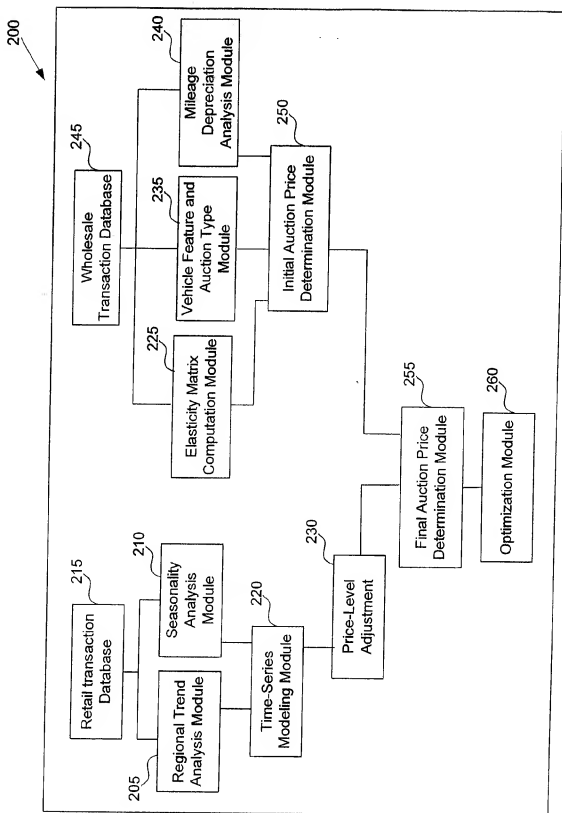
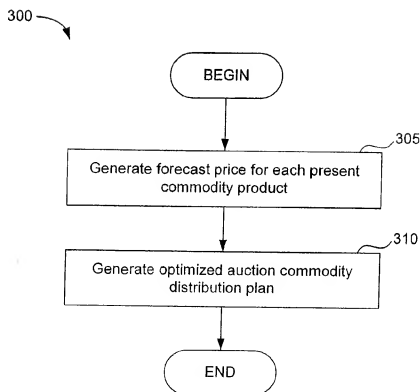
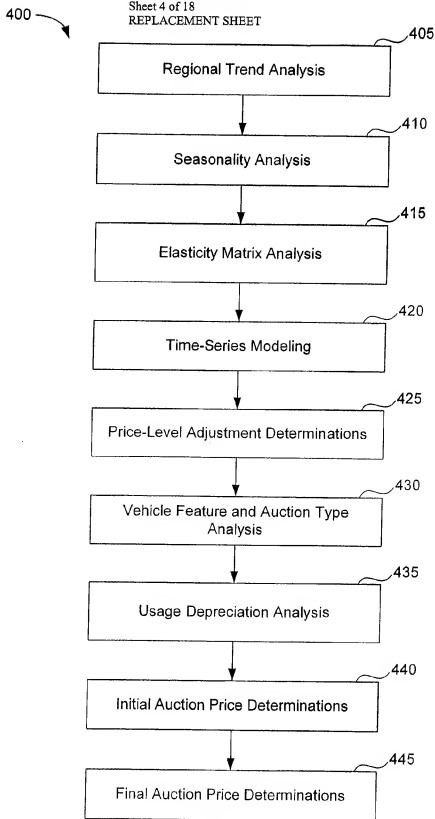


FIG. 2



**FIG. 3**



**FIG. 4**

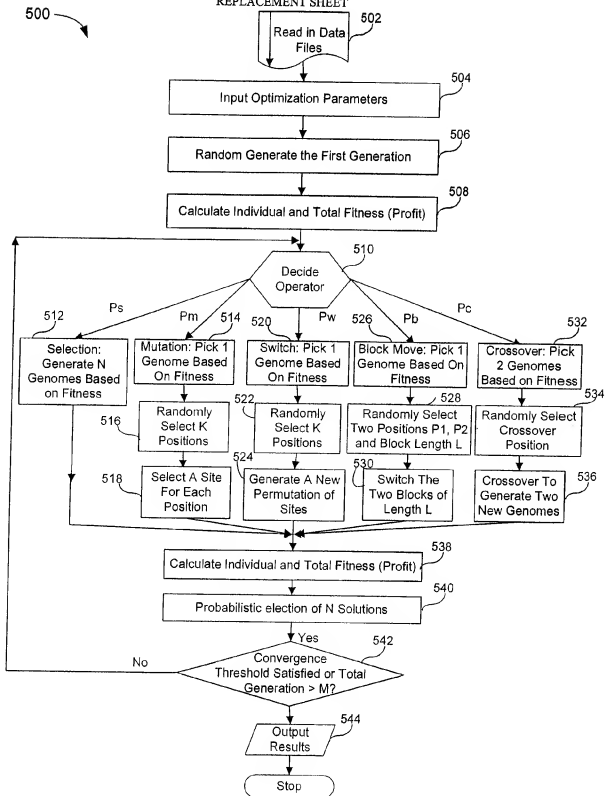


FIG. 5

# Genetic Operators

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- Selection
  - Randomly generates a new generation based on the fitness of the their parents

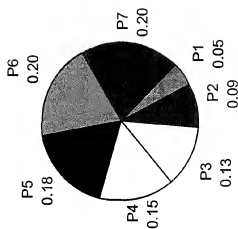


FIG. 6

# Genetic Operators

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- Mutation
  - Randomly selects  $N_m$  genes from a genome
  - Randomly assigns new auction sites to the  $N_m$  genes

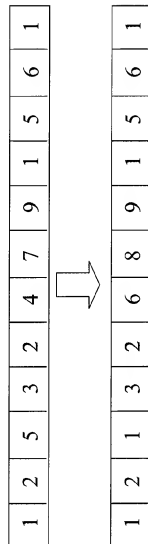


FIG. 7

# Genetic Operators

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- Switch
  - Randomly selects  $N_s$  genes from a genome
  - Randomly generates permutation of their auction sites

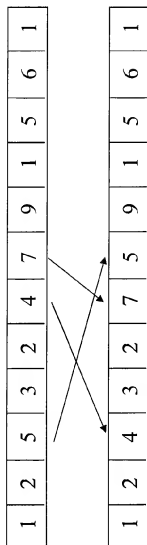


FIG. 8



# Genetic Operators

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- Block Move
  - Randomly selects two positions  $p_1$  and  $p_2$  in a genome
  - switch two blocks starting at  $p_1$  and  $p_2$  with length of  $N_b$

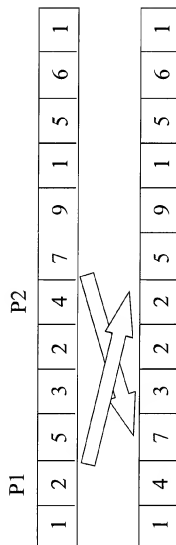


FIG. 9

# Genetic Operators

- Crossover
  - Randomly selects 2 genomes based on their fitness
  - Randomly selects a position in a genome and crossover the 2 genomes to form two new genomes

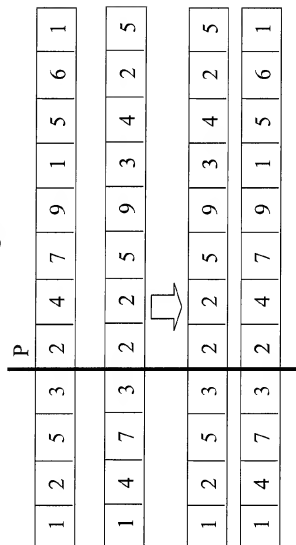


FIG. 10

# Original Auction Vehicle Distribution Plan

Inventors: CHENG et al.  
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REPLACEMENT SHEET

	500	501	503	506	508	509	529	530	532	533	535	537	538	539	540	550	553	554	556	557	558	567	586	590	593	594	595	597	598
VR101		33	8	5				25														2							
VR104					13			7				8				1						5							
VR107												1																	
VR108							1						13									1					112	82	
VR110									1										3	11	1						24		
VR112											18																		
VR113							58	1																					
VR114																													
VR115																													
VR116																													42
VR117																													
VR118																													
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VR126																													
VR130																													
VR131																													
VR132																													
VR133																													
VR134																													
VR135																													
VR136																													

FIG. 11

# Optimized Auction Vehicle Distribution Plan

	500	501	503	506	508	509	529	530	532	533	535	537	539	540	550	553	554	556	557	558	561	568	590	593	594	595	597	598
VR101	42	4	8	31	22	5						1				1	4	1			2							
VR104	2	1	2	4	2			2				23																
VR107	3	32	3													2	11				3	40	79	2	44	2		
VR108	3	6	2								2			5	1	3					4	58			3	4		
VR110												1																
VR112	3									8		3				1				3								
VR113	3					16	7	1								1	2	24	5									
VR114	2																											
VR115											6																	
VR116																	3											
VR117	3	22	13	21																								
VR118	8				6	1	1																					
VR119	1				16			4			1							3										
VR120																												
VR121																												
VR121					3	3											1		1									
VR122																		52										
VR123					1													2	3									
VR124	6	1			32					1							13	7	56	70	24							
VR125	1																											
VR126																												
VR130	11	11	2	28	29												8	1										
VR130																	4	8										
VR131																												
VR132						1							4															
VR133																			5									
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VR135	4																											
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FIG. 12

## Optimal vs. Original Distribution Plans

	<b><i>Original (\$)</i></b>	<b><i>Optimal (\$)</i></b>	<b><i>Change (\$)</i></b>
<b><i>Profit</i></b>	19,291,821	19,599,321	307,500
<b><i>Auction Revenue</i></b>	19,557,169	20,145,360	588,191
<b><i>Shipping Cost</i></b>	(131,947)	(381,808)	(249,861)
<b><i>Time Value Cost</i></b>	(25,158)	(35,314)	(10,156)
<b><i>Volume Elasticity Cost</i></b>	(59,230)	(53,770)	5,460
<b><i>Shipping Waste Cost</i></b>	(49,013)	(75,147)	(26,134)

FIG. 13

Results

Summary | Shipping | Inventory | Source | Price

Select

Vehicle Model Year

All

Vehicle Model

All

Package

All

Auction Site

Site22 (IN)

Display

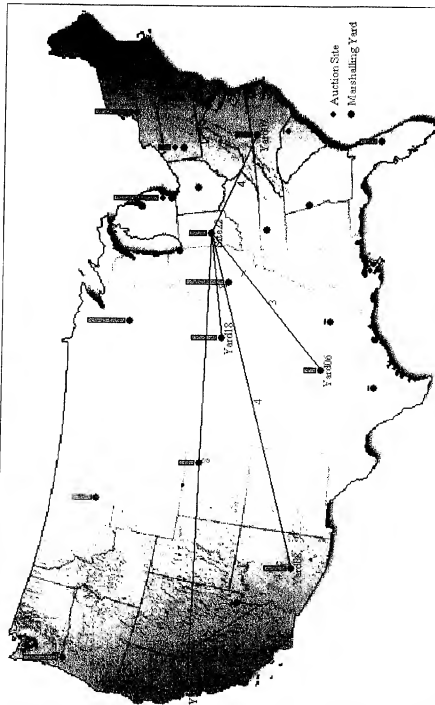
Save Results

File Directory

C:\Projects\ODAY\_DISTRIBUT

File Name

Save



Site Name	Ven. No.	Sale Price (\$)	Ship. T (d)	Ship. Cost (\$)	T to Auc (d)	Time Cost (\$)	Elas. Cost (\$)	Ship. Multi. Cost (\$)	Profit (\$)	Auc. D
Yard03 (CA)	8	10,573	2.7	5,380	3	240	0	0.00	78,991	1/2/2K
Yard06 (TX)	3	20,072	2.5	1,098	3	90	0	1830.00	57,196	1/2/2K
Yard07 (NC)	4	12,446	1.2	764	3	120	0	764.00	48,138	1/2/2K
Yard08 (AZ)	4	20,072	1.0	2,440	3	120	0	2440.00	75,288	1/2/2K
Yard16 (MO)	8	15,160	0.6	1,560	3	240	0	0.00	119,482	1/2/2K

FIG. 14

OK

Cancel

Help

Results

Summary Shipping Inventory Source Price

Select

Vehicle Model Year

All

Vehicle Model

All

Package

All

Marshalling Yard

Yard03 (CA)

Display

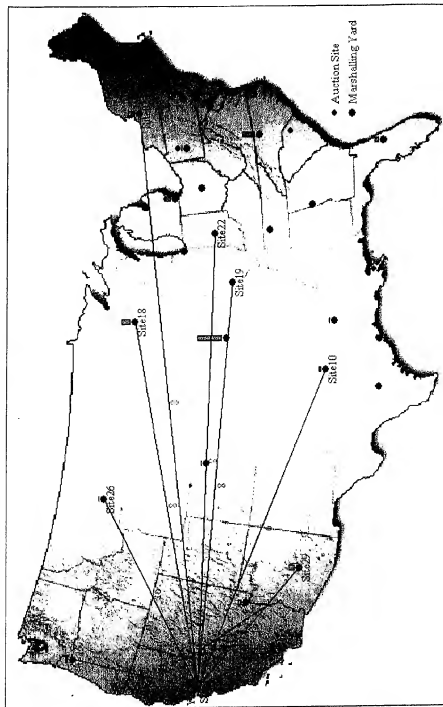
Save Results

File Directory

C:\Projects\ODAV\_DISTRIBUT

File Name

Save



Site Name	Vert. No.	Sale Price (\$)	Ship. T (d)	Ship. Cost (\$)	T to Ave (d)	Times Cost (\$)	Elas Cost (\$)	Ship Multi Cost (\$)	Profit (\$)	Ave
Site03 (NY)	8	20,381	17.2	6,384	30	2,400	670	0	153,558	1/2
Site04 (TX)	8	17,086	8.6	3,240	17	1,020	0	1,080	131,735	1/1
Site05 (WA)	8	14,264	3.7	4,632	16	1,280	365	0	111,048	1/2
Site06 (NY)	8	10,573	2.7	5,360	2	240	0	0	79,981	1/2
Site22 (CA)	24	15,585	1.1	3,394	2	480	0	0	393,578	1/1

Help

Cancel

OK

FIG. 15

# Results

Summary | Shipping | Inventory | Source | Price

-- Select

Vehicle Model Year

2001

Vehicle Model

SUV 4WD

Package

All

Display

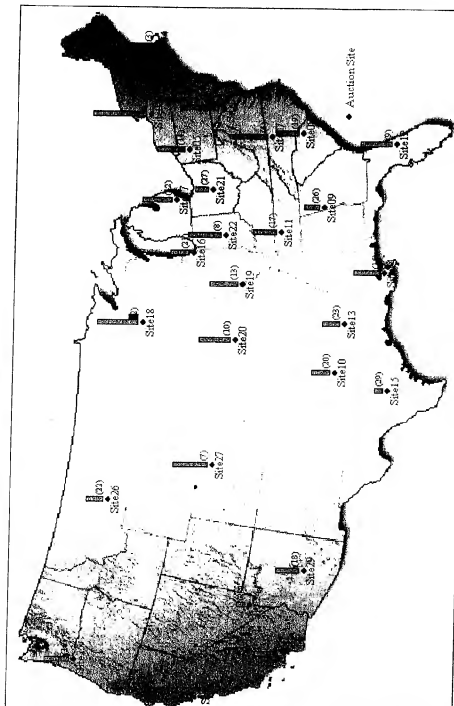
Save Results

File Directory

C:\Projects\ODAY\_DISTRIBUT

File Name

Save



Label	Name	City	State	Zip	Price (\$)	Est. Cost (\$)	Rank
Site1	Hallfield	Hallfield	PA	19440	20,097	0	6
Site2	Southern	E Windsor Hill	CT	06088	19,961	0	11
Site3	Tr-State	Syracuse	NY	13039	20,655	65	1
Site4	America	North Dighton	MA	02764-0	20,385	0	3
Site5	Buller	Ogle	PA	16066	19,862	0	14
Site6	Fredericks	Fredericks	VA	22402	20,197	0	5
Site7	Greensboro	Greensboro	NC	27407	20,205	0	4

Fig. 16

Help

OK

Cancel



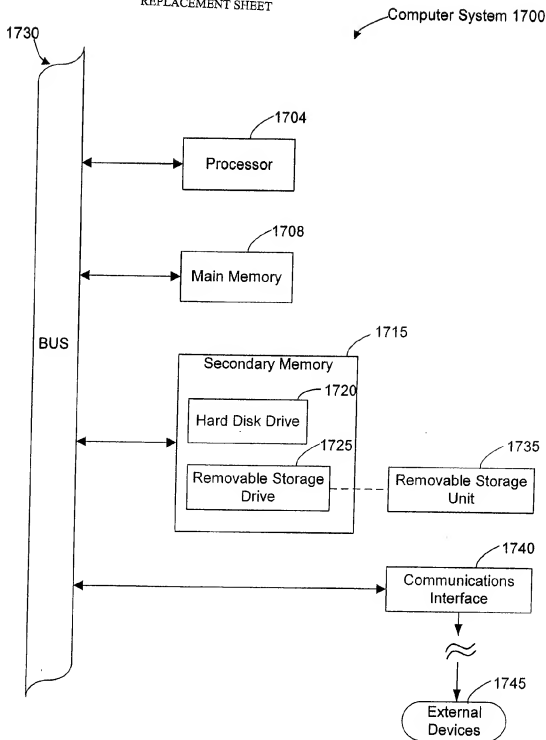
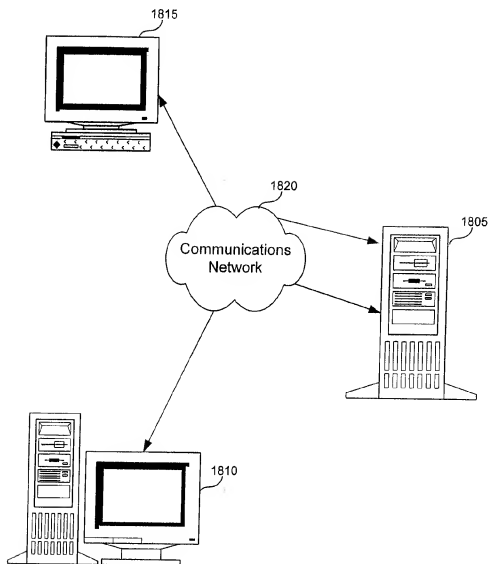


FIG. 17



**FIG. 18**